

ABSTRACT

The development of low dielectric constant materials from renewable resources such as plant oils and feathers is described in this invention. Soybean resin such as but not limited to, acrylated epoxidized soybean oil (AESO) and soybean oil pentaerythritol glyceride maleates (SOPERMA) is mixed with a reactive diluent such as but not limited to, styrene monomer. After that, various concentrations of chicken feather fibers or the fiber mats are mixed with the resin physically or using various process techniques such as resin transfer molding (RTM) and vacuum assisted resin transfer molding (VARTM) process. The mixtures are then free radically copolymerized at various temperatures to produce rigid composites. Surprisingly, the dielectric constants of the chicken feather composites are sufficiently low for electronic applications and lower than that of conventional semiconductor material such as silicon dioxide. Also, the mechanical properties of the composites are significantly enhanced with adding chicken feather fibers. The incorporation of the feather fibers gives rise to a considerable increase of stiffness of the soy oil-based composites. The density of the composites decreases with an increase of chicken feather fiber content.

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